

No. 705,533.

Patented July 22, 1902.

C. A. KITTS, Dec'd.

H. W. KITTS, Administratrix.

STEAM GENERATOR.

(Application filed Mar. 9, 1901. Renewed Apr. 3, 1902.)

(No Model.)

Fig. 1.

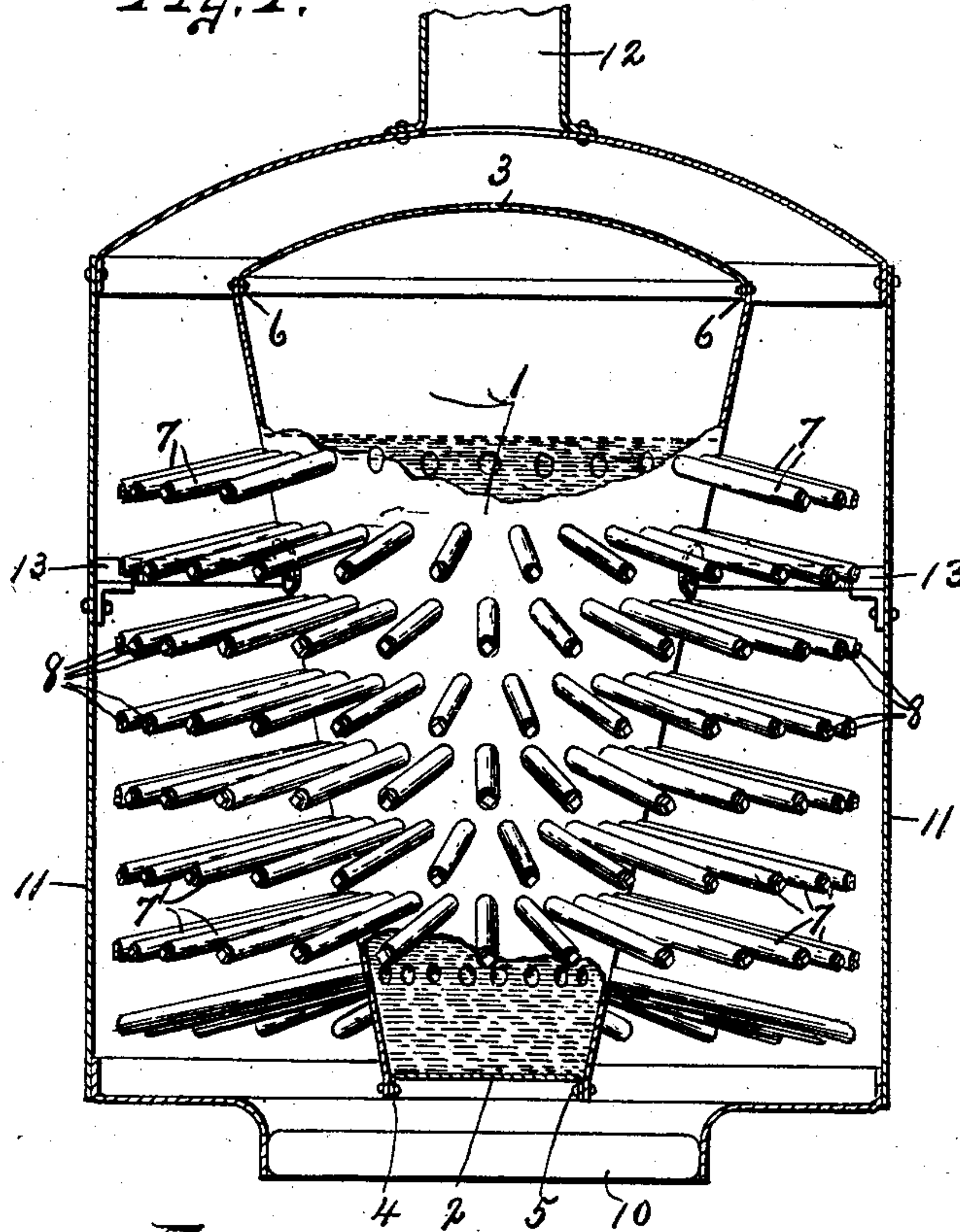
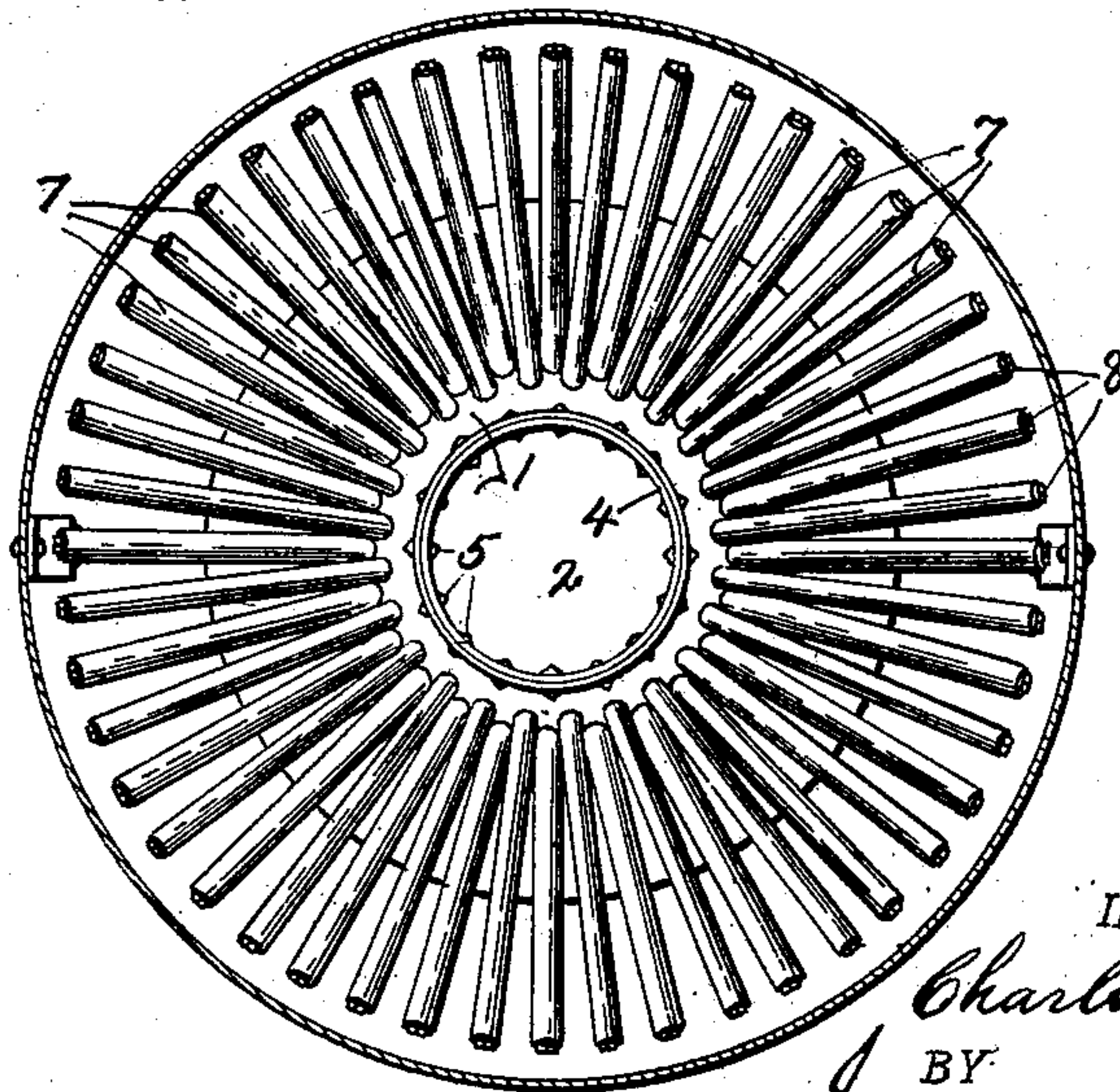


Fig. 2.



WITNESSES:

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STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 705,533, dated July 22, 1902.

Application filed March 9, 1901. Renewed April 3, 1902. Serial No. 101,233. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. KITTS, of Oswego, in the county of Oswego, in the State of New York, have invented new and useful
5 Improvements in Steam-Generators, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to improvements in
10 steam-generators.

The object of this invention is to produce a simple and compact boiler which is adapted for any use, and particularly for automobile use, in which a high degree of steam-pressure is required.
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The further object of this invention is to so construct and arrange the parts of the boiler as to utilize substantially all of the heat from the escaping products of combustion and to expose as large an area of the water-containing parts of the boiler to the heat as possible.
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A still further object of this invention is to lessen the cost of manufacture and to permit the parts to be readily assembled by ordinary or unskilled labor.
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To this end the invention consists in the construction, combination, and arrangement of the component parts of a steam-boiler, as
30 hereinafter fully described, and pointed out in the claims.

Referring to the drawings, Figure 1 is an elevation, partly in section, of my improved steam-generator shown surrounded by a suitable jacket and as superimposed above a burner. Fig. 2 is an end view of the detached boiler seen in Fig. 1.
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Similar reference characters indicate corresponding parts in both views.

40 In steam-generators for automobile use it is essential that the boiler be as compact and light as possible and that the parts be so arranged and constructed with reference to the heater that steam may be produced within a very short space of time and that the parts
45 of the boiler be so constructed as to permit the same to be readily repaired when desired without disassembling the whole boiler.

My invention is designed to accomplish
50 these results; and it consists of an inverted

truncated conical shell 1, having its opposite ends provided with suitable heads 2 and 3, the lower head being formed with a downturned annular flange 4, secured by rivets 5 to the adjacent walls of the smaller end of the shell. The head 3 is preferably concavo-convex in form and is also provided with an
55 inturned annular flange 6, secured to the adjacent or larger end of the shell 1, the crowning surface of the head 3 being uppermost. Secured to the side walls of the shell 1 are a series of substantially radial water-tubes 7, having their inner ends communicating with the interior chamber of the shell 1 and their
60 outer ends closed by plugs 8 or other equivalent means. These water-tubes 7 are arranged in staggered relation to each other and are preferably disposed at right angles to the side walls of the shell 1, being therefore inclined outwardly and downwardly from their
65 inner ends. The outer ends of the several water-tubes are usually disposed in substantially the same vertical circular plane, and it is therefore evident that the lower tubes are longer than the upper tubes, thereby bringing
70 the tubes of greater area nearest to the source of heat.
75

Any desired fuel may be employed for heating the boiler, and in Fig. 1 I have shown a burner 10, suspended from a suitable jacket 11, having its upper end provided with a flue 12 for the escaping products of combustion, it being understood that the burner 10 is arranged beneath and in close proximity to the base of the boiler or shell 1. It is also evident that any desired means may be employed for supporting the shell 1 and the parts attached thereto, and I have shown in Fig. 1 supports 13, having their inner ends secured to the shell 1 and their outer ends engaged
80 with shoulders or lugs provided upon the jacket 11.
85

It is apparent from the foregoing description that by forming the upper portion of the shell 1 of greater diameter than the lower
90 portion and by inclining the water-tubes outwardly and downwardly from said shell the products of combustion impinge against the overhanging surface of the shell and also the tubes 7 and that the staggered relation of the
95
100

tubes causes the products of combustion to pass in tortuous paths from the base of the boiler to the dome.

The operation of my invention will now be readily understood upon reference to the foregoing description and the accompanying drawings, and it will be noted that some change may be made in the detail construction and arrangement of the parts without departing from the spirit thereof—as, for instance, the outer ends of the water-tubes may be provided with caps instead of plugs, and the upper head of the boiler may be substantially flat instead of concavo-convex, and that other minor changes may be made within the scope of the invention, the essential feature being to form the upper portion of the boiler larger than its base and to provide the side walls of the boiler with a series of substantially radial water-tubes inclining downwardly from a horizontal plane.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A steam-generator comprising a water-containing shell having inclined side walls, and a series of water-tubes projecting from

said side walls at substantially right angles thereto and having their outer ends extended substantially equal distances from the center of the shell and closed.

2. A steam-generator consisting of a tapering water-containing shell having a series of water-tubes arranged in rows one above the other and inclining outwardly and downwardly therefrom, the tubes of each row being gradually reduced in length from the bottom row upwardly.

3. The combination with a burner and a heater-jacket, of an inverted truncated conical shell having a series of radial water-tubes extended outwardly from and at right angles to the side walls of the shell and closed at their outer ends, said outer ends being substantially equal distances from the center of the shell and disposed in a cylindrical plane parallel with the jacket.

In witness whereof I have hereunto set my hand this 23d day of February, 1901.

CHARLES A. KITTS.

Witnesses:

H. E. CHASE,

MILDRED M. NOTT.